

REMARKS

Reconsideration of this application, as amended, is requested.

Claims 1, 2, 9, 13, 14 and 32-39 remain in the application. Claims 3-8, 10-12, 15-18 and 20-31 were canceled earlier in the prosecution. Claims 38 and 39 have been added. Claims 1 and 34 have been amended to define the invention more clearly. Claim 36 has been amended to address a formal rejection raised in the Office Action.

Claim 36 was rejected under 35 USC 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner determined it was unclear how the apparatus could be configured such that "the rotation axis of the shaft extends substantially along the longitudinal axis of the reactor" when it was previously set forth in claim 1 that "the propeller has a longitudinal shaft defining a rotation axis...the propeller being tilted at an angle of from between 0.5° and 60° with respect to the longitudinal axis of the reactor."

Claim 36 has been amended to recite, "an apparatus according to claim 1, wherein the rotation axis of the shaft extends substantially along the longitudinal axis of the reaction chamber." It is believed that amended claim 36 particularly points out and distinctly claims the subject matter which the applicant regards as the invention. As such, claim 36 is believed to overcome the rejection.

Claims 1, 2, 9, 13, 14, 32, 34, and 35 were rejected under 35 USC 103(a) as being unpatentable over Yamashita et al (EP 0 614 866) in view of Paladino (US 2,703,304) and Roeckel et al. (EP 0 027 911). With regards to claims 1, 2, 32, 34, 36, and 37, the Examiner determined that Yamashita discloses an apparatus comprising a reaction chamber having an inlet and an outlet, the reaction chamber being provided

with a regulator comprising a propeller mounted in the reaction chamber in the region of the inlet; the reaction chamber being provided with at least one perforated element that is capable of allowing the passage of fluid material therethrough, and the propeller being mounted beneath the perforated element. The Examiner also determined that Yamashita discloses that the propeller has a longitudinal shaft defining a rotation axis and at least one blade attached to the shaft, the shaft having a rotation axis that extends substantially along the longitudinal axis of the reaction chamber. The Examiner acknowledged that Yamashita does not teach or suggest a propeller being tilted at an angle from 0.5° to 60° with respect to longitudinal axis of the reactor. However, the Examiner found that Paladino teaches a chamber comprising a propeller, wherein the propeller has a longitudinal shaft defining a rotation axis and at least one blade attached to the shaft, the propeller being tilted at an angle slightly offset with respect to the longitudinal axis of the chamber. The Examiner concluded that it would have been obvious to one skilled in the art to configure the propeller in the apparatus of Yamashita to be tilted at an angle within the claimed range as taught by Paladino.

In addition, the Examiner determined that Yamashita discloses that the propeller produces a downward flow, but acknowledged that Yamashita does not teach the blades being attached to the shaft by means of an elongated blade root. However, the Examiner found that Roeckel teaches a propeller having a longitudinal shaft defining a rotation axis and at least one blade attached to the shaft, wherein the blade is attached by means of an elongated blade root. The Examiner concluded that it would have been obvious to one skilled in the art to substitute a propeller with blades attached by means of an elongated root for the Yamashita propeller.

Regarding claim 9, the Examiner considered Yamashita to disclose the reactor being provided with a heating means. With regards to claim 13, the Examiner determined that Yamashita discloses the propeller being connected to a power supply for driving the propeller. As to claim 14, the Examiner found that Yamashita discloses the propeller comprises a plurality of vanes. With regards to claim 35, the Examiner determined that Yamashita discloses process of a conducting a chemical reaction using the apparatus set forth in claim 1.

Reconsideration is requested.

Claim 1 of the present application has been amended to recite, "An apparatus for use in conducting chemical or biological reactions requiring the input of at least one fluid reagent and/or the output of at least one fluid product, the apparatus comprising a reaction chamber having an inlet for the supply of at least one reactant and an outlet for the recovery of at least one product." Claim 1 further recites, "the reaction chamber being provided with a regulator comprising a propeller mounted in the inlet for dispersing the at least one reactant in the reaction chamber, wherein the propeller has a longitudinal shaft defining a rotation axis and at least one blade attached to the shaft by means of an elongated blade root, the propeller being tilted at an angle of from between 0.5° to 60° with respect to the longitudinal axis of the inlet." (emphasis added). Thus, the propeller recited in the present application is mounted in the inlet. The placement of the propeller in the inlet leads to improved reagent mixing in the reactor as the reactants enter or leave the reaction chamber, thereby giving rise to improved reaction rates and yields in the reactor.

In contrast, the prior art cited by the Examiner does not disclose a propeller mounted in the inlet. The propeller 9 in Yamashita is mounted in the reaction chamber. Similarly, the propeller 12 in Paladino and the propeller 532 in Roeckel are mounted in the reaction chamber and not in the inlet. Neither Yamashita, Paladino, nor Roeckel teach or suggest a apparatus for chemical or biological reactions whereby a propeller is mounted in an inlet. As a result, the present application is patentable over Yamashita in view of Paladino and further in view of Roeckel and is in condition for allowance. Claims 2, 9, 13, 14, 32, and 35-37 all depend directly or indirectly from claim 1. Thus, claims 2, 9, 13, 14 32, and 35-37 are allowable as well. Claim 34 is an independent claim that also has been amended to define the regulator as comprising a propeller mounted in the inlet and tilted at an angle to the inlet. For the reasons explained above, claim 34 is believed to be patentable over the applied art.

Claim 33 was rejected under 35 USC 103(a) as being unpatentable over Yamashita in view of Paladino and Roeckel as applied to claims 1, 2, 9, and 13 and further in view of Mineo et al (US 5,660,467). The Examiner acknowledged that Yamashita fails to disclose an electronic control unit associated with the apparatus for controlling the degree of heating or speed. The Examiner determined that Mineo teaches an apparatus comprising a propeller mounted in a reaction chamber wherein an ECU is associated with the apparatus for controlling the speed of the propeller. The Examiner concluded it would have been obvious to one skilled in the art at the time of the invention to provide an ECU in association with the modified apparatus of Yamashita.

Claim 33 depends indirectly from claim 1. Mineo fails to teach or suggest a propeller mounted in an inlet and therefore does not overcome the deficiency of the other art.. Claim 1 is believed to be in condition for allowance. Hence, claim 33 is believed to be allowable as well.

Claim 38 recites, “an apparatus for use in conducting chemical or biological reactions requiring the input of at least one fluid reagent and/or the output of at least one fluid product, the apparatus comprising a reaction chamber having an inlet for the supply of at least one reactant and an outlet for the recovery of at least one product, the reaction chamber being provided with a regulator comprising a propeller mounted in the outlet for dispersing the at least one reactant in the reaction chamber.” Yamashita, Paladino, and Roeckel fail to disclose a propeller mounted in the outlet. Hence, claim 38 is distinguished over the cited documents.

Claim 39 recites, “an apparatus to regulate distribution of at least one fluid reagent and the output of at least one fluid product, the apparatus comprising a reaction chamber having an inlet for supply of the at least one fluid reagent and an outlet for recovery of the at least one fluid product, the reaction chamber being provided with a regulator comprising a propeller mounted in the outlet for the distribution of the at least one fluid reagent in the reaction chamber.” Again, Yamashita, Paladino, and Roeckel fail to disclose a propeller mounted in an outlet. Thus, claim 39 is allowable over the prior art.

In view of the preceding amendments and remarks, it is submitted that all of the claims remaining in the application are directed to patentable subject matter, and

allowance is solicited. The Examiner is urged to contact applicant's attorney at the number below to expedite the prosecution of this application.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Gerald E. Hespos". The signature is fluid and cursive, with the first name "Gerald" and last name "Hespos" clearly distinguishable.

Gerald E. Hespos, Esq.

Atty. Reg. No. 30,066

Customer No. 01218

HESPOS & PORCO LLP

110 West 40th Street - Suite 2501

New York, NY 10018

Tel. (212) 725-2450

Fax (212) 725-2452

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